An Inventory of Biological Samples taken in the British Columbia Groundfish Fishery during 1982

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AN INVENTORY OF BIOLOGICAL SAMPLES TAKEN IN THE BRITISH COLUMBIA GROUNDFISH FISHERY DURING 1982

by

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ABSTRACT

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An inventory of biological samples taken in the British Columbia groundfish fishery during 1982 is presented. Samples are separated by species, area, time, depth range, sex and type of sample. A total of 172 samples of 16 species were collected. Sampling by species generally reflected abundance in landings except where special research considerations applied.

Key words: Groundfish fishery, biological sampling.

RESUME

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Le présent inventaire porte sur les échantillons biologiques prélevés en 1982 au cours de la pêche du poisson de fond en Colombie - Britannique. Les 172 échantillons recueillis sont divisés selon les 16 espèces rencontrées, la zone, le temps, les écarts de profondeur, le sexe et le genre d'échantillons. L'échantillonnage selon l'espèce reflète généralement l'abondance dans les débarquements sauf lorsqu'il y a des considérations scientifiques particulières.

Mots-clés: pêche du poisson de fond, échantillonnage biologique.

INTRODUCTION

The collection of biological samples from the groundfish fishery off the west coast of Canada is an important function of the Pacific Biological Station's Groundfish Program. Biological sampling is fundamental to our understanding of the dynamics of groundfish stocks, especially considering the extended longevity of many of these species (e.g. rockfish, sablefish, flatfish and dogfish).

Sampling is conducted primarily at the ports of Vancouver, Steveston and Prince Rupert, and at sea aboard commercial fishing vessels. Annual reports of these activities have been published in this format since 1970.

During 1982, there were 172 biological samples collected from commercial groundfish landings at various ports. This is an increase of 77% over the total number of samples collected in 1981. The most notable change in the 1982 sampling operation over that of 1981, was the representative sampling conducted in the port of Prince Rupert on a constant basis. This resulted in a dramatic increase in the number of samples collected from the major species landed (ie. flatfish, Pacific cod and Pacific ocean perch).

Sampling during 1982, as in past years, also reflected some significant changes in the fishery. The January to March closure for Pacific cod fishing in Area 3C (a conservation measure taken to protect cod stocks) was rescinded to the extent of allowing a limited fishery. Trawl vessels were allowed to land 50,000 lbs per trip to a maximum of two trips per month during this period. As a result, a large number of samples were collected from this fishery during the first quarter. A substantial decrease was noted for the number of walleye pollock samples collected in Area 4B. This reflected a sizable decline in catch and effort that was directly attributed to fluctuation in stock abundance.

Although catch and effort for some fisheries exhibited a noticeable decline during 1982, the total number of samples collected in those fisheries did show a marked increase. Examples include Pacific ocean perch and other rockfish in Areas 3C and 3D; Pacific ocean perch, other rockfish and Pacific cod in Areas 5A and 5B; Pacific cod in Area 5C; and some flatfishes in Area 5D. This situation was a direct result of having a more complete sampling coverage of the overall groundfish fishery.

Sablefish landings increased over the previous year but sampling opportunities were near non-existent. More than 90% of the coastwide sablefish quota was landed in a dressed-frozen condition by large trap-geared freezer vessels. Under such conditions, it was often necessary to conduct sampling on board commercial vessels at sea.

Extensive groundfish sampling was conducted at sea during 1982 aboard a number of vessels in the west coast trawl fleet. Continued excellent co-operation was received from the commercial fishing fleet in assisting the Groundfish Program toward attaining its sampling goals.

During the summer of 1982, the Joint-Venture Pacific hake fishery in Area 3C continued to expand. An even higher percentage of the larger vessels in the Vancouver-based trawl fleet and some from Prince Rupert participated in this fishery. As a result, there were fewer trawl landings from other major areas during the productive summer fishing period and thus limited sampling opportunities.

One of the three major groundfish processors in the port of Prince Rupert relocated its operations to the port of Steveston during 1982. This resulted in a decline in the number of trawl landings and volume of groundfish landed to the port of Prince Rupert.

Throughout 1982, 44,208 fish were sampled from commercial groundfish landings at various ports. All of these fish were processed for length measurements and sex data and 20,107 for age determination through the collection of scales, otoliths, fin sections or combinations of these structures. Maturity state readings were collected from most flatfish, rockfish and roundfish samples, while parabranchial-lesion incidence was noted in the majority of Pacific cod and walleye pollock samples. Observations relative to stomach contents were indicated in most samples collected for all groundfish species in 1982. The following figures indicate a percentage breakdown by species of the number of samples collected: Pacific cod--35%; rockfish--32%; flatfish--15%; walleye pollock--9%; lingcod--5%; Pacific hake--4%; and spiny dogfish-- less than 1%. A summary table of samples collected from groundfish landings by species and International (Major) Area (Fig.1) is given in Table 1. Details of samples collected during 1982 are given in Tables 2-17 for each species.

ACKNOWLEDGEMENTS

The collection of statistics and biological samples from the commercial fishery remains a cooperative effort between port samplers, fishermen and processors. The Pacific Biological Station port sampling staff expresses its sincere thanks to fishermen and processors for their valuable time and assistance during 1982.

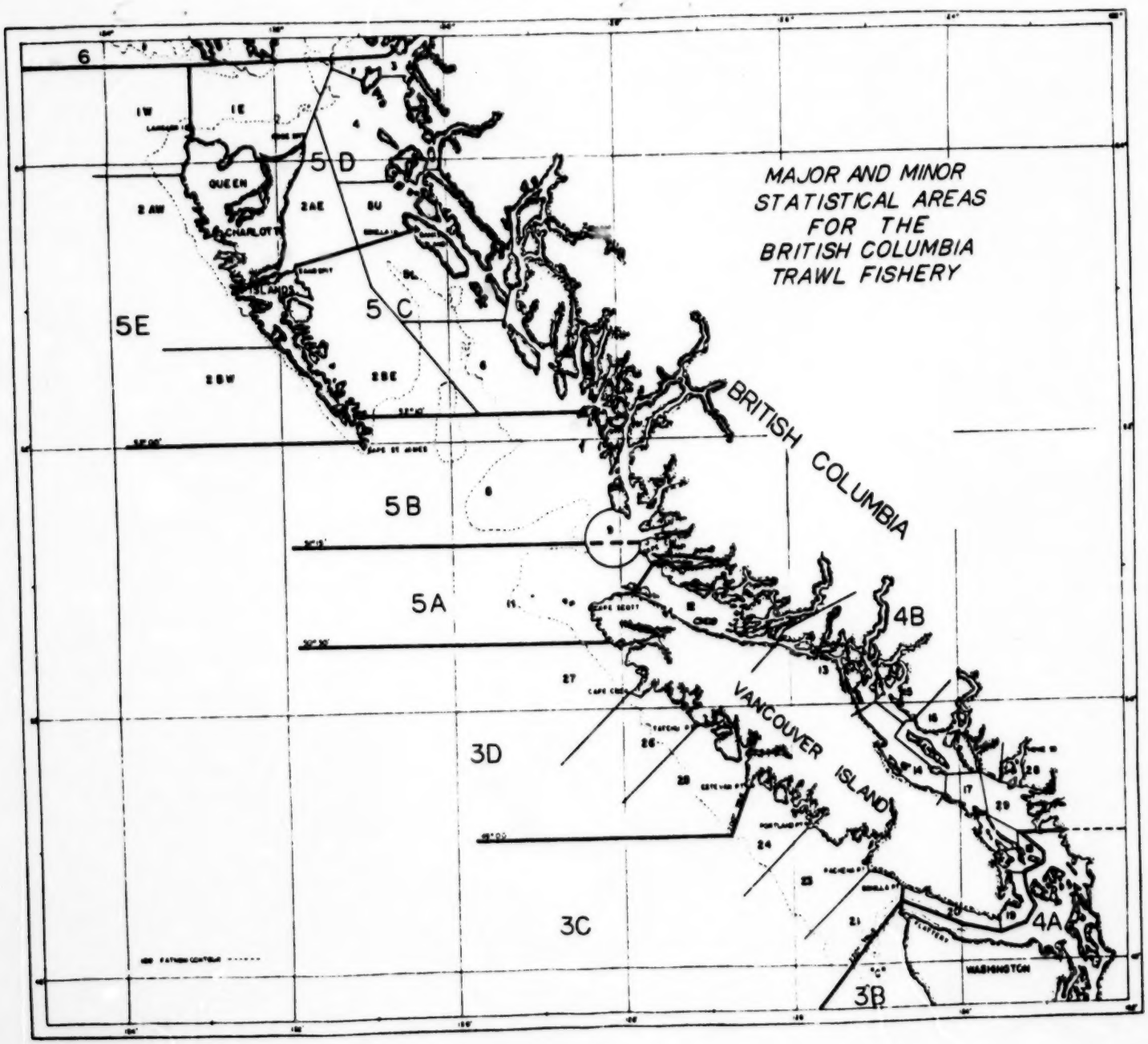
MAJOR AND MINOR
STATISTICAL AREAS
FOR THE
BRITISH COLUMBIA
TRAWL FISHERY
6
5 D
5 C
5E
5B
5A
3D
3C
3B
4B
4A
BRITISH COLUMBIA
VANCOUVER ISLAND
QUEEN
CHARLOTTE
ISLANDS
WASHINGTON

Fig. 1.

Table 1. Number of samples collected from British Columbia groundfish landings in 1982, by species and International Area.

Species	Area								Total
	3C	3D	4B	5A	5B	5C	5D	5E	
Flatfish									
Arrowtooth flounder	-	-	-	1	-	-	-	-	1
Dover sole	3	-	-	-	-	-	7	-	10
English sole	-	-	-	-	-	-	6	-	6
Petrale sole	1	-	-	-	-	-	-	1	2
Rock sole	-	-	-	2	1	-	3	-	6
Rockfish									
Canary rockfish	-	2	-	1	-	-	-	-	3
Pacific ocean perch	5	1	-	-	21	6	-	6	39
Rougheye rockfish	-	-	-	-	-	-	-	2	2
Silvergray rockfish	-	1	-	2	-	-	-	-	3
Yellowmouth rockfish	-	-	-	2	2	-	-	2	6
Yellowtail rockfish	1	-	-	-	1	-	-	-	2
Roundfish									
Lingcod	4	-	-	1	3	-	-	-	8
Pacific cod	14	1	6	5	4	11	20	-	61
Pacific hake	-	-	7	-	-	-	-	-	7
Walleye pollock	-	-	3	-	-	-	12	-	15
Selachii									
Spiny dogfish	-	-	1	-	-	-	-	-	1
Total	28	5	17	14	32	17	48	11	172

Table 2. Arrowtooth flounder (Atheresthes stomias) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5A	June	37-61	30	238	268	-	238	238	VF10101-10338
Total fish sampled					268			238	

Table 3. Dover sole (Microstomus pacificus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3C-3D	Mar	215-260	200	100	300	-	100	100	VF9101-9200
3C	Apr	160-260	272	55	327	-	-	-	
		198-230	189	112	301	-	112	112	VF9501-9612
5D	Jun	60-70	180	140	320[a]	-	140	140	PRF6476-6615
		65-95	40	260	300[a]	-	260	260	PRF6616-6875
	Jul	60-70	30	270	300[a]	-	270	270	PRF7164-7433
	Aug	65-80	66	245	311[a]	-	245	245	PRF7434-7678
		68-106	91	214	305[a]	-	214	214	PRF7679-7893
		68-82	65	240	305[a]	-	240	240	PRF7894-8133
		70-80	109	197	306[a]	-	197	197	PRF8339-8535
Total fish sampled					3,075			1,778	

[a]Maturity data not collected.

Table 4. English sole (Parophrys vetulus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5D	Jan	55-60	171	129	300	171	129	300	PRF4665-4964
	Feb	48-69	60	240	300	-	240	240	VF8801-9040
	Apr	43-60	54	260	314[a]	-	260	260	PRF5565-5824
	Jul	27-42	13	288	301[a]	-	288	288	PRF6876-7163
	Apr	42-52	130	171	301[a]	-	171	171	PRF5825-5995
	Nov	52-70	26	200	226[a]	-	200	200	PRF8536-8735
Total fish sampled					1,742			1,459	

[a]Maturity data not collected.

Table 5. Petrale sole (Eopsetta jordani) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3C	Apr	198-230	206	68	274	206	68	274	VF9201-9474
5E	Feb	217-220	279	20	299	279	20	299	PRF5265-5564
Total fish sampled					573			573	

Table 6. Rock sole (Lepidopsetta bilineata) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5A	Jun	35-40	12	100	112	-	100	100	VF9701-9800
		36-38	13	287	300	-	287	287	VF9801-10087
5B	Oct	58-60	31	269	300	-	269	269	VF10401-10669
5D	Apr	16-19	41	260	301[a]	-	260	260	PRF5996-6255
	May	17-18	82	220	302[a]	-	220	220	PRF6256-6475
	Aug	53-55	98	205	303[a]	-	205	205	PRF8134-8338
Total fish sampled					1,618			1,341	

[a] Maturity data not collected.

Table 7. Pacific ocean perch (Sebastes alutus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3C									
	Jan	150-185	236	67	303	161	39	200	VNRF5001-5200
	Nov	137-170	112	188	300	73	127	200	VNRF9801-10000
	Feb	220-230	129	176	305	88	112	200	VNRF5201-5400
3C&3D	Mar	160-260	193	111	304	113	87	200	VNRF5601-5800
	Nov	155-175	136	169	305	91	109	200	VNRF9601-9800
3D	Feb	170-245	133	168	301	87	113	200	VNRF5401-5600
5B	Feb	140-160	245	18	263	188	12	200	PRRF6366-6565
		140-160	165	139	304	112	88	200	PRRF6566-6765
		120-180	243	57	300	161	39	200	PRRF6766-6965
	Mar	150-165	299	1	300	199	1	200	PRRF7166-7365
	Apr	108-200	234	66	300	158	42	200	PRRF8201-8400
	May	140-200	149	151	300	100	100	200	PRRF8601-8800
		150	134	166	300	88	112	200	PRRF9001-9200
	Jun	145-250	162	138	300	108	92	200	PRRF9501-9700
	Jul	140-200	104	147	251[a]	-	-	-	-
	Aug	170-180	67	233	300	44	156	200	PRRF10101-10300
		150-170	105	206	311	68	132	200	PRRF10501-10700
	Sep	152-160	145	155	300	98	102	200	PRRF10701-10900
	Oct	140-175	183	117	300	125	75	200	PRRF10901-11100
		138-160	205	95	300	135	65	200	VNRF9201-9400
	Jun	125-158	201	130	331	123	77	200	VNRF7201-7400
	Jul	106-126	189	116	305	124	76	200	VNRF8601-8800
	Jun	90-115	195	213	408	96	104	200	VNRF7801-8000
		120-130	113	137	250	82	118	200	VNRF8401-8600
	Aug	100-200	31	269	300	21	179	200	PRRF10301-10500
	Oct	134-140	169	131	300	112	88	200	PRRF11101-11300
	Nov	[b]	173	132	305	112	88	200	VNRF9401-9600
5C	May	140-150	145	151	296	99	101	200	VNRF6801-7000
	Jun	125-150	127	201	328	74	126	200	VNRF7001-7200
		96-150	194	106	300	69	31	100	PRRF9201-9300
		[b]	137	164	301	91	109	200	VNRF7401-7600
	Jul	[b]	77	223	300	56	144	200	PRRF9901-10100
	Jun	[b]	101	178	279	63	137	200	VNRF8001-8200
5E	Feb	170-265	160	140	300	107	93	200	PRRF6966-7165
	Apr	150-200	56	244	300	36	164	200	PRRF7566-7765
	Apr	120-200	161	139	300	106	94	200	PRRF8401-8600
	May	138-180	33	371	404	16	184	200	PRRF8801-9000
	Nov	123-140	160	140	300	107	93	200	PRRF11301-11500
		160-190	177	123	300	119	81	200	VNRF10001-10200
Total fish sampled				11,854			7,500		

[a]Maturity data not collected.

[b]Depth not available.

Table 8. Canary rockfish (Sebastes pinniger) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3D	Apr	76-82	130	128	258	106	94	200	VNRF5801-6000
3D-5A	Jun	76-87	277	91	368	152	48	200	VNRF8201-8400
5A	Apr	92-102	59	21	80	59	21	80	PRRF7766-7845
Total fish sampled					706			480	

Table 9. Rougheye rockfish (Sebastes aleutianus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5E	Mar	195-240	154	146	300	104	96	200	PRRF7366-7565
	Apr	160-200	167	133	300	117	83	200	PRRF8001-8200
Total fish sampled					600			400	

Table 10. Silvergray rockfish (Sebastes brevispinis) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length M	Length F	Length T	Age (otolith) M	Age (otolith) F	Age (otolith) T	Serial number
3D	Sep	64-82	73	180	253	57	143	200	VNRF9001-9200
5A	Apr	60-95	163	141	304	112	88	200	VNRF6001-6200
5A & 3D	Sep	54-79	99	153	252	77	123	200	VNRF8801-9000
Total fish sampled					809			600	

Table 11. Yellowmouth rockfish (Sebastes reedi) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	Length-maturity F	Length-maturity T	Age (otolith) M	Age (otolith) F	Age (otolith) T	Serial number
5A	Jun	148	67	239	306	50	149	199	VNRF6401-6600
		140-150	114	268	382	55	145	200	VNRF7601-7800
5B	Feb	140-160	54	39	93	-	-	-	-
	Jun	145-190	127	173	300	85	115	200	PRRF9701-9900
5E	Jan	120-185	179	123	302	116	84	200	PRRF6166-6365
	Jun	128-170	161	141	302	108	92	200	PRRF9301-9500
Total fish					1,685			999	

Table 12. Yellowtail rockfish (Sebastes flavidus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length M	Length F	Length T	Age (otolith) M	Age (otolith) F	Age (otolith) T	Serial number
3C	May	54-60	150	174	324	98	102	200	VNRF6601-6800
5B	Apr	66-86	239	66	305	164	36	200	VNRF6201-6400
Total fish sampled					629			400	

Table 13. Lingcod (Ophiodon elongatus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length M	Length F	Length T	Age (fin ray) M	Age (fin ray) F	Age (fin ray) T	Serial number
3C	Jun	50	67	133	200[a]	67	133	200	12303-12502
	Jun	34-55	78	122	200	78	122	200	10853-11053
	Jul	36-45	125	133	258[a]	125	133	258	11611-11877
		34-42	117	140	257	117	140	257	11254-11610
5A	Apr	71-84	-	200	200	-	200	200	11054-11253
5B	Jun	40-72	93	108	201	93	108	201	12102-12302
		49-68	54	170	224	54	170	224	11878-12101
	Oct	56-62	53	147	200	53	147	200	13356-13555
Total fish sampled					1,740			1,740	

[a] Maturity data not collected.

Table 14. Pacific cod (Gadus macrocephalus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity-cyst M	F	U	T	Age (scale) M	F	T
4B	Jan	46-64	61	59	-	120	61	59	120
		46-50	66	54	-	120	66	54	120
	Nov	60-65	124	139	-	263	-	-	-
	Dec	46-55	102	101	-	203	-	-	-
	Mar	30-36	142	136	-	278	-	-	-
		50-65	103	187	-	290	-	-	-
3C	Feb	32-38	97	85	-	182	-	-	-
		35-48	75	106	-	181	-	-	-
		32-42	113	108	-	221	-	-	-
	Mar	30-44	104	111	-	215	-	-	-
		36-38	201	42	-	243	-	-	-
		22-40	108	85	-	193	-	-	-
		22-36	202	89	-	291	-	-	-
		24-42	156	90	-	246	-	-	-
		24-26	147	113	-	260	-	-	-
	Apr	28-48	143	127	-	270	-	-	-
	Mar	21-46	138	78	-	216	-	-	-
	May	40-48	137	91	-	228[a]	-	-	-
	Nov	42-72	72	86	-	158	-	-	-
	Sep	40-64	111	158	-	269[a]	-	-	-
3D	May	50-80	150	101	-	251[a]	-	-	-
5A	Apr	60-95	93	105	-	198	-	-	-
		58-105	105	123	-	228[a]	-	-	-
	Jun	62-64	84	94	-	178[a]	-	-	-
	Jul	44-65	99	87	-	186[a]	-	-	-
	Jun	35-43	176	187	-	363[a]	-	-	-
5B	Apr	65-96	69	78	-	147[b]	-	-	-
	Jun	39-64	85	93	-	178[a]	-	-	-
	May	76-93	75	99	-	174[a]	-	-	-
	Jun	41-58	44	117	-	161[a]	-	-	-
5C	Jan	58-65	69	51	-	120	69	51	120
	Feb	58-65	121	97	-	218	-	-	-
	Mar	55-60	100	105	-	205	-	-	-
		58-60	92	110	-	202	-	-	-
	Apr	28-42	92	108	-	200	-	-	-
	Jun	50-54	-	-	327	327	-	-	-
		46-62	110	116	-	226[a]	-	-	-
		50-56	138	144	-	282[a]	-	-	-
	Jul	28-54	76	99	-	175[a]	-	-	-
	Aug	30-54	90	97	-	187[a]	-	-	-
	Sep	30-60	120	125	-	245	-	-	-

Table 14 continued.

Area	Month	Depth (fm)	Number sampled: Length-maturity-cyst M	F	U	T	Age (scale) M	F	T
5D	Jan	40-90	53	67	-	120	53	67	120
		48-70	65	55	-	120	65	55	120
	Feb	56-58	88	100	-	188	-	-	-
		46-60	103	100	-	203[a]	-	-	-
		28-76	76	124	-	200	-	-	-
	May	54-58	98	119	-	217[a]	-	-	-
	Nov	60-62	98	130	-	228[a]	-	-	-
	May	10-14	97	132	-	229[a]	-	-	-
		10-16	87	79	-	166[a]	-	-	-
		12-16	76	139	-	215[a]	-	-	-
		12-21	74	139	-	213[a]	-	-	-
	Aug	40-70	103	111	-	214	-	-	-
	May	10-14	102	115	-	217[a]	-	-	-
	Jun	26-42	113	94	-	207[a]	-	-	-
	Jul	30-47	105	102	-	207[a]	-	-	-
		27-42	96	105	-	201[a]	-	-	-
		14-27	110	100	-	210	-	-	-
		20-45	92	117	-	209	-	-	-
	Sep	43-62	110	100	-	210	-	-	-
		33-60	112	92	-	204	-	-	-
Total fish sampled						12,876			600

[a] Maturity data not collected.

[b] Sample may contain fish from Area 5A.

Table 15. Pacific hake (Merluccius productus) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
4B	Jan	40	183	120	303	-	-	-	-
		40	63	57	120	-	-	-	-
		60-80	199	101	300	199	101	300	C9110-9409
	Nov	45-55	68	64	132	-	-	-	-
	Apr	60-65	95	105	200	95	105	200	C10565-10764
		50-65	127	73	200	127	73	200	C10765-10964
	Nov	70	190	110	300	190	110	300	C13633-13932
Total fish sampled					1,555			1,000	

Table 16. Walleye pollock (Theragra chalcogramma) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length-maturity-cyst M	F	T	Age (fin ray) M	F	T	Serial number
4B	Mar	80	172	78	250	68	32	100	P63101-63200
		75-80	248	2	250	98	2	100	P63301-63400
		70-76	113	144	257	42	58	100	P63201-63300
5D	Jun	32-76	84	167	251[a]	36	64	100	P53180-53279
	Sep	48-62	76	174	250[a]	28	72	100	P53500-53599
		50-62	52	198	250[a]	21	79	100	P53600-53699
	Oct	40-60	60	190	250[a]	22	78	100	P53800-53899
		50-60	85	165	250[a]	35	65	100	P53900-53999
		90-105	74	175	249[a]	26	73	99	P53700-53799
		50-60	108	142	250[a]	44	56	100	P54000-54099
		90-110	98	338	436[a]	-	-	-	-
	Nov	50-100	85	228	313[a]	-	-	-	-
		50-100	96	225	321[a]	-	-	-	-
		90-110	75	195	270[a]	-	-	-	-
		60-85	114	200	314[a]	-	-	-	-
Total fish sampled					4,161			999	

[a]Maturity data not collected.

Table 17. Spiny dogfish (Squalus acanthias) samples taken during 1982.

Area	Month	Depth (fm)	Number sampled: Length M	F	T
4B	Jan	57-62	29	288	317
Total fish sampled					317